Ministerial Importance and Survival in Government

Tough at the Top?

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Abstract

Are holders of important ministerial positions more likely to survive in cabinet than their colleagues who hold less important positions? This study examines the relationship between the importance of a ministerial position and the length of time ministers are able to survive in government. It is based on an original dataset of cabinet ministers in seven West European countries from 1945–2011. Employing a little-used measure of ministerial survival based on overall time in government, we find that holders of important ministerial positions are more durable than their colleagues who hold less important ministerial positions. Age, prior government experience and the size of the party to which the minister belongs are also associated with consistently significant effects. Further, we explore the determinants of survival for two types of risk – exiting government with one's party and exiting without it – showing that the effects of ministerial importance and other covariates are markedly different for these two types of exit. Our findings have important implications for our understanding of ministerial and governmental stability.

Introduction

Holding senior ministerial office for an extended period of time is a central career ambition for many politicians. The length of time for which ministers are able to remain in government also has important implications for political stability and processes at the core of democracy. If government personnel change frequently then ministers may lack the time they need to get to grips with both the individual requirements of their position and the machinery of government in general (Rose 1971: 406); they may also lack the capacity to respond to or represent voters effectively in the policymaking process. If, by contrast, ministers are able to stay in government indefinitely, we might question the extent to which mechanisms of accountability and democratic scrutiny are fully functioning. As Fischer *et al.* (2012: 516) argue, ministerial duration tells us "at least as much about the government's accountability and stability as government durability".

In this study, we contribute to the developing literature on ministerial stability by exploring the relationship between individuals' time in government and the importance of the ministerial positions they hold.[1] In both theory and practice ministerial offices are not considered equal, with some associated with significantly more power than others. On the basis of the principal-agent and coalitional relationships that characterize cabinet government in parliamentary democracies, we identify mechanisms that plausibly link ministerial importance and duration in government. Our main hypothesis, developed on the basis of this discussion, suggests that holders of more important ministerial positions are more likely to stay in office longer. We examine this link empirically by comparing the time spent in government by cabinet ministers in seven West European parliamentary democracies between 1945 and 2011. Our findings support the hypothesis that ministerial importance and duration are positively related: holders of important ministerial positions tend to survive for longer. However, we show that the determinants of survival in government differ markedly for individuals who leave government with their parties and individuals who leave government without them.

The paper proceeds as follows. We begin by identifying determinants of ministerial tenure and we establish our central hypothesis. We then present our operationalisations of ministerial importance and ministerial stability, discussing in particular how our measure of stability diverges in important respects from existing work and why this is important. In the analysis, we model the impact of ministerial importance on survival in government. We conclude by highlighting the contribution made

[1] A 'ministerial position' is the office or collection of offices held by an individual at any one time. In the context of this article, 'ministerial importance' refers to the importance of the ministerial position held.

by this study to contemporary work on ministerial careers and present some avenues for further research suggested by it.

Ministerial importance and survival in government

Delegation and accountability in parliamentary systems can be understood as a chain running from voters to parliament and from parliament to the prime minister (or government) with delegation continuing to individual ministers through to their ministries (see especially Berlinski *et al.* 2012, Ch.2 for a review and discussion; also Hansen *et al.* 2013: 229-30; Strøm *et. al*. 2010). Formally, ministers' immediate principal in this chain is the prime minister, meaning that the prime minister enjoys a significant degree of control over who becomes a minister. In some contexts they may have sole control, although it is widely accepted that parties often add another layer to these principal-agent dynamics, with party leaders playing a key role in 'hiring and firing' ministers, especially in the context of a coalition (Dowding and Dumont 2009; Huber and Martinez-Gallardo 2008: 171).

Party leaders and prime ministers also have the power to decide when to end a minister's tenure. Exit from government, however, is not determined by ministers' principals alone. First, ministers can end their own time in government by choosing to resign or retire. Second, ministers' parties play a dual role: as well as being their effective principals, they provide the basis for the minister's career in government. Their defection from coalition or loss of office has implications for their ministers' tenure. Indeed, if we assume that ministers do not switch parties, their party's continued presence in cabinet is a necessary condition for their own survival in government.

The key actors that determine both the start and end of a minister's time in office within this setting are therefore the prime minister, the minister's party and the minister themselves. Each of these key actors may be influenced by the importance of the position held by the minister.[2] The principal-agent framework suggests that principals (both parties and prime ministers) may experience problems of adverse selection (they may choose the wrong agent) and moral hazard (agents may act against their interests). We expect therefore that they should seek to minimize these problems (agency loss) by screening appointees before delegation. The incentive to conduct such screening is likely to be stronger when the ministerial position in question is more important (Berlinski *et al.* 2007: 259-60; Hansen *et al.* 2013: 23; Huber and Martinez-Gallardo 2008: 171-2).

[2] In this discussion, we aim to identify a wide range of potential mechanisms. Empirically identifying all of these mechanisms is beyond the scope of this paper. However, we hope that this discussion might form a basis for their identification.

That a minister holds a more-important position should also provide incentives to retain that minister in cabinet. After delegation, dismissing the holder of an important ministerial position may reflect poorly on the principal, as this is a more serious admission of poor judgment in selection than dismissing the holder of a less-important position. The prime minister will also take into account the overall stability of their position, and that of their government: the more politically important the position held by the individual, the more destabilizing their dismissal is likely to be for policy and for any negotiated inter- (or intra-)party equilibrium. Moreover, holding a less-important ministerial position increases the relative value of the agent's options outside of cabinet (see also Berlinski *et al.* 2007: 259). Hence, ministerial resignations and party defections are plausibly influenced by the importance of the ministerial office(s) held. All else being equal, the more important the office, the greater the costs of leaving office for both parties and individuals.

There are of course reasons to expect that, under certain conditions, principals may also have greater incentives to dismiss holders of important ministerial positions. Holders of important positions handle more consequential and difficult issues and hence will face more scrutiny by a range of other actors, including parliament and the public, via the media (Berlinski *et al.* 2007: 259).[3] They may also face greater scrutiny from their own colleagues in cabinet and in their own department (for example, junior ministers – see e.g., Thies 2001) acting as mutual checks. Prime ministers may view holders of more-important ministerial positions as credible rivals and therefore as targets for exclusion from power when the opportunity arises.

On balance, however, we expect individuals who hold more important positions to survive for longer in government, which leads to our hypothesis:

The greater the importance of an individual's ministerial position, the more likely they are to survive in government.

Of course, there are factors other than ministerial importance that can affect an individual's time in government by influencing the decisions of their principals, their party or themselves. The *age* of a minister can be important, as prime ministers may want to "rejuvenate" their cabinet at certain points (Dowding and Dumont 2009: 14), meaning older ministers become gradually more likely to be replaced; and ministers will also eventually reach the age of retirement. On the other hand, min-

[3] The Home Office, for example, is one of the most important ministerial positions in the UK, but it is also regarded as a "graveyard" for political careers, because of its responsibility for highly sensitive matters relating to crime and immigration, and the ease with which things can go wrong. Under the recent period of Labour government (1997-2010), no less than six different Home Secretaries were appointed. Likewise, Fischer *et al*. (2012: 515) point to the reputation of defence portfolios in Germany and Australia as "ministerial graveyards".

isters with previous *experience* may be more adept at handling a crisis and therefore more likely to survive. While Bakema (1991: 71-6) argues that neither age nor parliamentary experience account for variation in the duration of careers of individual ministers, other studies (e.g., Berlinski *et al.* 2007) have found that age and experience are associated with reduced survival.

Another personal factor of potential importance is a minister's *gender*. The underrepresentation of women in political office is well known: there are far more male members of parliament and ministers than there are female ones (see Krook and O'Brien 2012). But it may be that the women who do obtain ministerial positions also face discrimination during their ministerial career, and are therefore less successful at retaining office. That said, Berlinski *et al.* (2007: 258) find the opposite: the female ministers in their sample (in the UK) tended to survive for longer than their male counterparts.

Party- and country-level factors also affect the prospects of ministerial survival. The *size* of the party to which the minister belongs is important: smaller parties should be less durable in government, while larger parties are likely to offer their ministers longer survival times (Schofield and Sened 2006: 3-4; see Brancati 2005 on regionalist parties). Existing research has also pointed to the structure of the *party system* as an important factor. Bakema argues that a smaller number of parties in the party system makes the formation of smaller coalitions more likely, providing additional stability (see Bakema 1991: 82-3). *Larger cabinets* (i.e., more ministerial positions), meanwhile, offer greater scope for reshuffling rather than removing ministers, enhancing ministers' prospects of survival in government.

Finally, given the important role of political parties in ministerial careers as necessary conditions for ministerial survival, we expect that the determinants of ministers' exits while their party remains in government may be quite different from the determinants of ministerial exits that result from a coalition party's defection or from its failure to hold onto office. Thus, in addition to examining the variables outlined above, we investigate the following secondary research question: *are determinants of tenure different for ministers that leave with their party and ministers that leave without them?* In relation to this question, and in the absence of an existing body of work on parties' survival in government (although see Tavits 2008 and Warwick 2012 on the distinct but related question of defection), our study is exploratory.

Measuring position importance and duration in ministerial office

In this section, we set out our approach to the measurement of the two key variables in our study: the importance of a ministerial position and the length of time a minister remains in it. Existing studies provide some initial support for our expectation that the importance of a ministerial position is related to the amount of time ministers are able to remain in it (Bäck *et al.* 2012: 200; Berlinski *et al.* 2007; Huber and Martinez-Gallardo 2008: 176). However, these studies have used relatively inexact measures of the importance of these positions. Berlinski *et al.* (2007) employ a four-part ordinal scale of different government positions in the UK (from whip to cabinet member), but they do not distinguish between individual ministerial positions. Studying presidential cabinets in Latin America, Escobar-Lemmon and Taylor-Robinson (2005: 833; see also 2008) develop country-invariant groupings of high-, medium- and low-prestige ministries based on a qualitative assessment of their control of policy and patronage, financial resources, prestige and visibility. Huber and Martinez-Gallardo (2008) use a dichotomous variable, based on Laver and Hunt's (1992) expert survey, to distinguish the top two ministries from seven other less-important ministries. To more fully measure the variation in the importance of different positions, and in line with Hansen *et al.* (2013; see also Bäck *et al.* 2012: 202), we employ data from an existing expert survey on portfolio salience to create an aggregate score for each minister based on the number and type of portfolios they hold (the exact process of this aggregation is described more fully below).

Our most significant departure from the existing literature on ministerial durability is in the measurement of survival in office. Conventionally, studies of ministerial durability have measured time in office within individual cabinet terms, with the end of a cabinet being defined by events such as changes in prime minister, general elections and a party leaving government (amongst others). On the other hand, mainly descriptive studies that focus on "career aspects and mere time in office" measure ministers' continuous spells in office, ignoring technical terminations brought about by these 'cabinet-ending' events (Fischer *et al.* 2012: 508-509; see also Bakema 1991; Frognier 1991: 119-120; Jäckle 2013; Verzichelli 2009: 90).

A second way in which studies of ministerial tenure can vary is in respect of their focus on tenure within a single ministerial office (e.g., Hansen *et al.* 2013; Huber and Gallardo-Martinez 2008; Quiroz-Flores 2009) or, alternatively, continuous survival within government as such. As Quiroz-Flores acknowledges (2009: 131), measures that focus on tenure in a single office do not distinguish between ministers who exit government and ministers who are moved around within government, including those who are promoted to a higher office. Nor do they take into account their time in cabinet before attaining a particular ministry.

These variations in operationalisations of the dependent variable speak to particular theoretical concerns: survival in a single office corresponds to a general concern with ministerial movement or "general cabinet instability" assuming that dismissal, resignation, promotion and demotion all generate instability (Hansen *et al.* 2013: 235). Measuring tenure within a cabinet term facilitates a focus on prime ministerial management between elections (see e.g., Berlinski *et al.* 2012: 14). Many studies feature measures of ministerial stability that have both of these characteristics, focussing on ministerial stability in single positions within cabinet terms (e.g., Bäck *et al.* 2012: fn.54; Berlinski *et al.* 2012: 65; Hansen *et al.* 2013; see also contributions to Dowding and Dumont 2009).

--- TABLE 1 ABOUT HERE ---

These measurement decisions have important empirical implications. Take, for instance, the early ministerial career of Brian Lenihan Senior, who was in government in Ireland continuously from November 1964 until March 1973. He was Minister for Justice from 1964 until 1966 under two different prime ministers and during two legislatures. Then, between March 1968 and March 1973 he consecutively occupied three different positions within one cabinet: Education, Transport and Power, and Foreign Affairs. In summary, he occupied four different ministerial positions and was a member of three different cabinets during this period. Table 1 illustrates the implications of varying the ways in which his tenure is measured. The number of spells in office identified ranges from one spell of approximately eight years and four months (in the bottom-right cell) to six spells of between three months and three years and seven months (in the top-left cell). This example is illustrative and not all spells in office are as long and varied as this one. However, it is notable that 43% of spells in office in our data set (see description below) span more than one ministerial position, indicating that these variations in measurement have implications far beyond isolated cases.

The focus of our study is somewhat different from the concern with ministerial movement and prime ministerial management that underlies the most common way of measuring ministerial tenure in the literature (i.e., tenure in one position and within one cabinet). We assume that the most important distinction in a ministerial career is the distinction between being in government and being outside it, rather than the distinction between being moved (up, down or out) and not being moved. We also assume that survival in government through elections and prime ministerial changes is important. We suggest that ministerial tenure, measured in this way, has important implications for background concerns that frame the study of ministerial careers.

Take political stability, for example: exits from government are a significant indicator of instability, arguably more so than ministerial movements more generally. For studies that focus on survival in

government (rather than ministerial movements or individual prime ministers' management strategies), this means that conventional measures of ministerial survival are often truncated. This has further implications for variance in the dependent variable, as it ignores long, multi-position or multi-cabinet spells in government and artificially inflates the number of short spells in office. In the context of existing studies of ministerial durability, our approach to ministerial survival opens up the question of whether existing results concerning the effect of ministerial importance (Bäck *et al.* 2012; Berlinski *et al.* 2007; Hansen *et al.* 2013; Huber and Gallardo-Martinez 2008) and other covariates are robust to a different dependent variable. In other words, does ministerial importance also matter for 'mere time' in government?

Ministerial careers in seven West European democracies

Cross-country analyses have only very recently entered the study of ministerial durability due to limitations in the availability of (digital) data on ministerial appointments, portfolio allocation and personal characteristics. Here we study ministerial duration for a number of stable parliamentary democracies with coalition cabinets over the entire post-war period. Our data includes full ministerial appointments in seven West European countries from 1945 to 2011: Austria, Finland, Germany, Iceland, Ireland, Luxembourg and Sweden. Ministers who were already in office in 1945 had that particular spell backdated to their entry into government, eliminating any problems of left-censoring. The approach allows us to move beyond single country studies and to derive some cross-country findings while still being able to apply more fine-grained measures of portfolio importance and personal characteristics than other large-n cross-country comparisons.

The countries studied are similar in several respects: they are long-established democracies, a distinction that appears to have important implications for ministerial stability; all are parliamentary democracies, which further limits variation (see Fischer *et al.* 2012: 510-1 for a short review of these factors); and each has had a broadly proportional electoral system during this period. These permissive electoral rules lead to regular instances of coalition government with small parties in cabinet. In other respects, the countries provide diverse settings in which our hypothesis can be tested (Seawright and Gerring 2008: 301-2). They vary in important constitutional and political characteristics, such as the role of additional veto players in ministerial selection and deselection that constrain prime ministers, the presence of both single-party and coalition governments (Dowding and Dumont 2009: 13; see also Huber and Martinez-Gallardo 2008: 172-3), the fragmentation of the party system, the frequency of elections and whether ministers are expected to be experts or generalists (see also Bakema 1991: 95; Bakema and Secker 1988; Blondel 1980; Dowding and Dumont

2009: 11-12; de Winter 1991). They also vary widely in country size, which is associated with the apparent number of ministerial career scandals (Fischer *et al.* 2012: 515; Kristinsson, 2009: 200; Fischer *et al.* 2006). Government formation rules are both positive, in Germany, Ireland, Luxembourg, and negative, in Sweden, Austria, Iceland, Finland (Strøm *et* al. 2010: 525). Some of the systems have important subnational governments, which can provide external career options (Dumont *et al.* 2009: 138), while others do not.[4] They are also known to be diverse on the dependent variable, ranging from Luxembourg's notable ministerial stability to the rapid turnover of Finnish ministers before the 1990s (Bakema 1991).

--- TABLE 2 ABOUT HERE ---

Table 2 summarizes the individual-level variables that we use in our analysis by country (see Appendix A3 for party- and system-level variables). The dependent variable is the amount of time an individual spends, uninterrupted, as a cabinet minister. This may include multiple appointments to different ministerial positions, and can span multiple consecutive cabinets. The data set covers 1,654 such spells in government. The duration of the average spell in government is 3.6 years, although this varies quite widely (sd = 3.4). National averages (from 1.8 years in Finland to 5.9 years in Luxembourg) also vary considerably. Several countries (Sweden, Luxembourg, Germany, Austria) have average spells in government that exceed the country's average inter-election period, indicating the empirical significance of measuring the dependent variable across multiple ministerial positions and multiple cabinets. Of the 1,654 spells, 27% represent an individual's second or subsequent spell in government; 84% are occupied by men; and 7% encompass a period in the prime minister's office. The mean age at the beginning of a spell in office is just under 50 (a value that is consistent with earlier cross-national studies – see e.g. Bakema 1991: 71) and this is remarkably homogenous across the seven countries: every national average is within two years of the overall average (see Appendix A3).

For our main independent variable, we use data from an expert survey on portfolio salience that provides the best available cross-nationally comparable data on ministerial importance in Western Europe from 1945-2000 (Druckman and Warwick 2005). Druckman and Warwick provide scores for most portfolios in the countries their survey covers. They asked country experts to rate the importance of different ministerial portfolios in their own country, relative to an "average" ministerial portfolio with an importance value of 1.0. This results, for example, in prime ministerial positions

[4] Their diversity further highlighted in the variation that we observe between countries in respect of the variables included in our analysis (see table 2 and Appendix A1).

being considered to be two to three times as important as an average portfolio. For our study, we aggregate country expert scores on portfolio importance for particular ministerial positions based on the respective portfolios included in the position. In common with Hansen *et al.* (2013; see also Bäck *et al.* 2012: 202), our approach leads to a continuous measure for the importance of every individual ministerial position, moving beyond binary and ordinal scales used in existing work. However, we also correct for sources of systematic bias by weighting the raw portfolio scores in the data and by assigning default values for missing portfolio information (see Appendix A2 and Bright et al. 2012: 11-16 for details).

The average importance of positions held by a minister during their spell in office is 1.31: here, the variation in national averages ranges from 1.13 in Germany to 1.82 in Luxembourg. In the data a one unit difference equates to a large variation in ministerial importance. By way of illustration, a one-unit difference approximates the difference between the prime minister's office and the following offices in each of the seven countries: Trade in Austria; Foreign Affairs in Germany; Education in Iceland; Health in Ireland; Public Works in Luxembourg; and Health and Social Affairs in Sweden (Druckman and Warwick 2005: 37-41).

We also include several party- and system-level variables in our data set. These include party size measured as percentage seat share in the lower house of parliament, the party's left-right position, measured on an eleven-point scale, using the mean value of a number of expert surveys (Döring and Manow 2012); the size of the cabinet measured as the number of ministerial positions available in the cabinet; the number of parties in government; and the effective number of parties, calculated using the seat distribution in parliament (Laakso and Taagepera 1979). These variables are summarized by country in Appendix A1.

--- FIGURE 1 ABOUT HERE ---

Figure 1: Survivor function by ministerial importance (n=1654)

Modeling importance effects

We model ministerial duration using techniques drawn from event history analysis (see Box-Steffensmeier and Jones 2004), which has become the standard choice for recent studies of ministerial careers (e.g. Berlinski *et al.* 2007; Hansen *et al.* 2013; Huber and Martinez-Gallardo 2008; Quiroz-Flores 2009). A Kaplan-Meier survival curve provides a first indication of the relationship be-

tween ministerial importance and survival in government (figure 1).[5] The graph shows that ministers holding positions of below-average importance have a lower probability of survival than their colleagues who hold more important positions and a log-rank test confirms that this difference is statistically significant (Mills 2011: 80-1). The curve also shows when these divergences take place. Up to around four years there is a small but significant difference between survival rates for holders of ministerial positions of above- and below-average importance. After about four years, the difference between the groups widens considerably, indicating that those holding positions of relatively low importance find it especially difficult to survive beyond one legislative term. This provides some *prima facie* indication that the main hypothesis is supported.

We now present a fuller analysis of the impact of ministerial importance on tenure (see table 3). Our model of choice is the Cox proportional hazards model, which allows us to estimate the effect of multiple independent variables on the 'hazard rate' of a given minister. The hazard rate can be defined as the chance ministers have of being removed from their post at any given point in time.[6] The most useful feature of this model is that it makes no assumption about the underlying shape of the hazard being modeled, which would be difficult for us to specify in advance (Box-Steffensmeier and Zorn 2001: 975). The coefficients for each variable can be interpreted as a percentage effect on the hazard rate, with those above 1 indicating an increase in the rate, and those below 1 indicating a decrease, for every unit change in the variable in question (Mills 2011: 94-5). For example, in model 1, for every additional year in the age of a minister at the start of their office, their hazard rate is increased by 1%, meaning that the probability of survival is reduced. The results of our analysis are summarized in models 1 to 5, shown in table 3. Model 1 is our baseline model, which includes all explanatory variables, while models 2 to 4 represent modifications made to test and improve on the validity of our findings. Model 5 allows us to account for differences in ministerial tenure and party exit from cabinet.

--- TABLE 3 ABOUT HERE ---

Several aspects of the baseline model 1 are important to discuss. The importance of a ministerial position has a positive relationship with duration (a negative effect on a minister's hazard rate) that is highly statistically significant, reducing their likelihood of being removed from office by around 27% for every one point increase in importance, lending support to the main hypothesis of our study. Likewise, being prime minister at any point during a ministerial spell in office also increases

[5] For legibility the confidence intervals have been omitted.

[6] We use the "Efron" method for handling tied data, which is appropriate when there are a large number of ties, as is the case in our model (see Box-Steffensmeier and Jones 2004: 54-8).

the likelihood of duration (reducing the hazard rate). As expected, increases in both the number of parties in government and the size of the minister's party increase the chances of survival, while the effective number of parties at the last election is associated with reduced chances of survival.

In model 1 all covariates are coded in a 'time invariant' fashion. This represents an approximation only, as most of the variables in question do change while the minister is in office. For example, if a minister changes position, their corresponding importance score will change as well. In order to deal with this problem, model 2 introduces time-varying covariates. We split up our observations into month long periods, resulting in a dataset with approximately 76,000 person months. In each period, all time-varying covariates are remeasured. Only gender and previous experience (a dummy variable) remain time-invariant. These remeasurements are then 'lagged' by a month to control for problems of causal ordering, although the value for the first month remains necessarily the same. The major impact of model 2 is to diminish the statistical significance of the 'prime minister' variable.

Model 3 makes adjustments to model 2 on the basis of a test of the validity of the proportional hazards assumption, which Box-Steffensmeier and Jones call "the primary concern when fitting a Cox model" (2004: 131). A Cox model assumes that the effect of individual covariates remains at the same level over time (i.e., that the effect of gender in the first year of office is the same as that in the fifth year of office). If this assumption is violated, coefficient estimates become unreliable. Box-Steffensmeier and Jones recommend using Grambsch and Therneau's global proportional hazards test as a way of validating this assumption (2004: 137). The results of this test show that model 2 is indeed in likely violation of the assumption (see Appendix table A2). In order to compensate for this problem, model 3 stratifies model 2 on the basis of three variables which seem to have particularly disproportionate effects: the effective number of parties in parliament, the number of parties in government, and cabinet size (number of ministers). Two strata are created for each variable, divided around the median value. We aimed to keep the number of strata as low as possible in order to retain an acceptable number of observations in each category. Further tests of the proportional hazards assumption on model 3 show that the model is now performing acceptably (see Appendix A3). The impact of stratification on the results is very small, with little notable change.

Thus far models 1 to 3 have assumed that all observations are independent from each other. This is often a strong assumption, and especially so in the case of ministerial careers. In theory at least, ministers are related to each other in a number of ways, most importantly by cabinet membership and party affiliation, whilst their country of origin also provides a shared context. It is likely that

these relationships will have consequences for a minister's hazard rate. Descriptive statistics in table 2, for example, show that there are significant differences between ministerial survival times across countries. In order to control for this potential interdependence, we estimate a 'nested' shared frailty model (model 4). Shared frailty models allow us to account for unobserved subgroup heterogeneity that might be caused by factors such as party membership, and have been successfully applied in other studies of ministerial careers (see Bäck et. al. 2012: 194; Huber and Martinez-Gallardo 2008). Nested shared frailty models allow for subgroups to be divided into further groups, following a logic identical to that of multilevel analysis. In model 4, we adjust for the effects of parties nested within countries. We chose not to include cabinet membership because individual careers often span multiple cabinets, while shared frailty modules should restrict each individual to membership of one group per level. Given the theoretical importance of differences across party and country groupings and given the diversity among the countries included in the analysis, it is perhaps surprising that model 4 is largely consistent with the results reported in model 3, the only major differences being diminished statistical significance for some of the variables, including ministerial importance.

Models 1 to 4 take a 'pooled risks' approach to ministerial survival. That is to say, all types of ministerial termination are treated as the same event, and hence are assessed in the same framework. However, there are good reasons to question such an approach. In particular, as discussed above, ministers who exit the cabinet because their party has left the government (either because the party defects or loses office) seem to experience a different type of event than those who leave while their party remains in power (i.e., those who resign or are dismissed). To assess this possibility, models 5a and 5b report the results from a 'competing risks' model based around the 'latent survivor time' approach (Box-Steffensmeier and Jones 2004: 168-9). Model 5a focuses on ministers who left office without their party: these are resignations and dismissals. Those who left office with their party are treated as censored observations. Model 5b focuses on those that left office at the same time as their party, censoring observations that ended in exit from office without the party. This isolates the effect of individual variables in increasing the hazard for a particular type of risk. In all other respects, both models are the same as model 4.

Models 5a and 5b present markedly different results. With the partial exception of prime ministerial status, the coefficients for each covariate point in different directions in each of these models. This is an empirical indication that these two types of exits from government are quite different processes and that the timing of these two types of exit has different determinants. Model 5a, which focuses on exits from government without the minister's party, resembles models 1 – 4 in many respects.

The main hypothesis receives support: important ministers are protected from dismissal and resignation. This result reflects the nature of the mechanisms that we expected to underpin the positive effect of importance on the likelihood of survival in government (see theoretical discussion above). It is clear that they should account better for individual exits than for party defection or events at which parties otherwise lose office.

Male ministers and members of smaller parties are also protected from this type of exit in model 5a. This may reflect the greater influence that male politicians have traditionally had within their parties, even controlling for the importance of their ministerial positions. The greater susceptibility of holders of more-important positions and male ministers to exit with their party (in model 5b) likewise indicates their capacity to lead their party out of government. The significant coefficient for party size in model 5a points to the fact that ministers (especially party leaders) in small parties are better-able to take their party with them when they leave government, while bigger parties with more ministerial positions have more potential to shuffle around ministers within their party's ministerial contingent rather than dismissing them. Interestingly, there is also a large and significant coefficient for party position on the left-right axis, which points in opposite directions in models 5a and 5b. This is something which we had little theoretical reason to expect, but it appears that ministers in parties further to the right have a greater hazard of resignation or dismissal whilst in government. This finding may indicate that these parties are less internally stable than their counterparts further to the left.

How robust is the relationship between ministerial importance and survival in government over time? Druckman and Warwick's (2005) data are the best available measures of ministerial importance with cross-national scope. The long time period covered by the data provides some confidence that importance scores reflect the value of individual positions, rather than the importance of specific officeholders. However, one of their potential weaknesses is that, although ministerial positions are reconfigured over time, the portfolio salience values provided by Druckman and Warwick are time-invariant. It is quite reasonable to argue that this is implausible: that important portfolios in the 1960s may be less relevant today, or *vice versa*.[7] Hence, we test the robustness of our main finding over time. We do so by re-estimating model 1 for three different periods (1945-1970; 1970-1990 and 1990-2011; see appendix A3). Each period contains approximately 500 spells in government and the coefficient for ministerial importance is 0.80, 0.62 and 0.65, respectively, with each being statistically significant. Likewise, reestimating model 4 for the three periods produces coefficients

[7] Hansen et al. (2013, 236), in response to this criticism, point out that these measures do (in conjunction with party's seat contribution) predict inter-party portfolio allocation over time.

of 0.79, 0.90 and 0.87 for these periods, albeit with only the first of these being statistically significant (the full results of these models are produced in appendix A3).

Empirical findings

Our study leads to several important findings. Firstly, we have shown a positive and consistently significant relationship between the importance of a ministerial position and their survival in government. The more important the position, the longer they are able to remain in government. In particular, ministerial importance protects them from dismissals and resignations that are unrelated to their party's exit from government. These findings reinforce the principal-agent perspective on ministerial selection that emphasises the need to reduce agency loss through screening of candidates and highlights that the level of this screening may vary with the importance of the position. It also adds to a small body of cross-national research on ministerial durability (c.f. Hansen *et al.* 2013; Huber and Martinez-Gallardo 2008) by specifying a new dependent variable (survival in government) and a refined measure of the main independent variable (ministerial importance).

Secondly, a variety of personal level variables, such as age, gender and previous experience influence survival in government according to our findings. In particular, we have demonstrated a strong association between increased age and a higher probability of exit from government (an increased hazard rate), supporting conclusions in other (mostly single-country) studies (e.g. Berlinski *et al.* 2007). We reach different conclusions to Berlinski *et al.*'s study of the UK in terms of gender however: the men in our study have a significantly higher survival rate once we take a competing risks approach, indicating that although in general women might survive for longer in government, they are also more likely to be sacked or to resign between elections. The findings we produce on gender and ministerial survival complement the focus of current research on gender and ministerial selection (Annesley *et al.* 2014).

Thirdly, the analysis confirms that the party to which the minister belongs clearly makes a difference. As we expected, the size of a minister's party is positively associated with survival, even when taking into account the decreased risk of loss of government office at elections for larger parties (which we examine through a competing risks model). The left-right position of the party also has an impact when examined in the competing risks models, with ministers that represent parties further to the right facing increased risk of resignation or dismissal but reduced risk of their party losing or leaving office, although we lack a theoretical explanation as to why this might be the case. The analysis, especially model 5b, has highlighted both the timing of party exits from government

and the differences between parties further to the left and those further to the right as areas for further study.

Fourthly, at the country-level, a higher number of parties in the party system is associated with reduced survival time, as expected, but a higher number of parties in government is associated with *increased* survival time, contradicting Bakema's (1991) hypothesis about smaller coalitions providing additional stability for ministers. As we know, cabinet stability is distinct from ministerial stability: governments can fall whilst ministers remain in power. Also at the country-level, the apparent protection offered by large cabinet size may reflect the latitude that this offers for shuffling ministers rather than removing them. However, we are unable to confirm these country-level findings as system-level variables are stratified out of models 3-5.

Conclusion

Our study contributes to several developing facets of the literature on ministerial careers. Firstly, following Fischer *et al.* (2012) it draws attention to important varieties of dependent variable in the study of ministerial tenure that have received little attention in the existing literature. It applies a little-used measure of ministerial tenure (uninterrupted survival in cabinet) that has important implications for individual politicians and for the political systems in which they play a part. Secondly, the study employs the best measure of ministerial importance currently available in a study on ministerial careers, which allows more accurate estimates of the effect of ministerial importance on ministerial tenure. Thirdly, the study presents one of the first analyses that investigates individual determinants of ministerial survival across countries, hence moving beyond single country studies that still dominate the field. Finally, we have pushed the boundaries of ministerial career research by employing a competing risks model that separates the causes of leaving cabinet with one's party from the causes of leaving cabinet without one's party. This highlights that further development of the conventional principal-agent framework accounting for the dual nature of parties as both principals *and* as platforms for ministerial careers may be necessary. This is particularly important for studies that examine ministerial time in office that can span several cabinets.

We demonstrate that ministerial importance has a robust effect on tenure. The more important a minister's position, the more likely he or she is to remain in office. This finding is robust to various modelling strategies, different specifications of ministerial importance and to controlling for contextual variables and personal characteristics of each minister. It adds to established findings that have demonstrated the impact of office importance on tenure in single party (Westminster) cabinets (Berlinski *et al.* 2007), to work that focuses on cabinet and portfolio level variables (Huber and

Martinez-Gallardo 2008), and to other studies that analysed this relationship using different operationalisations of the independent and dependent variables (e.g., Hansen et al. 2013). However, our study does also highlight that there is a relationship between ministerial importance and party exit from coalition cabinet that has received little attention in existing work. Our analysis suggests that more important ministers are able to draw their party out of government coalitions.

The timing of party exits from coalition government and its connection to ministerial careers merits further investigation. In this respect, one of our models (model 5a) highlights an important lacuna and indicates that more important ministers can take their party out of cabinet. However as of today, the theoretical mechanisms that link coalition dynamics and ministerial tenure are ill specified and are in need of appropriate principal-agent models. The literatures on defection (e.g., Warwick 2012), strategic dissolution (e.g., Strom and Swindle 2002) and cabinet stability (e.g., Saalfeld 2008) may provide starting points for theoretical development. In order to empirically identify the mechanisms proposed by this paper, further studies, including comparative case studies, are required.

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APPENDIX:

This appendix provides some more details about the collection and coding of data used for the study, and reports results from a check of the 'proportional hazards' assumption in the final model.

A1: System- and party-level variables

--- TABLE A1 ABOUT HERE ---

A2: Data Collection and Coding

Here we provide a short introduction into our data infrastructure; a full account is provided in Bright *et al.* (2012: 11-16). Our tenure data is based on Lars Sonntag's *Politica* website (www.kolumbus.fi/taglarsson), which lists ministerial appointments for a wide variety of countries covering the complete timespan of interest. A computer programme was written which allowed the data on the website to be systematically harvested and then inserted into the Parlgov database (Döring and Manow 2012); it was then augmented with other information (such as birth dates) which was itself harvested from a variety of sources. This automatically-entered data was both cleaned (to remove minor typographical errors) and checked by hand using a variety of different official government websites and publications for the countries in question (see Bright *et al.* 2012: 7-8). The data on Sonntag's website for the countries covered here was found to be of a high quality with only a few minor errors relating to dates of ministerial entry or position held.

The raw data is compiled in a database distinguishing separate entities such as persons, ministerial spells, portfolios and external data (including Druckman and Warwick 2005). Ministerial spells are recorded for each ministry and individual cabinets. All ministries are linked to portfolios solely based on the name of the ministry. A Ministry for Culture and Sports would include two portfolios. Our ministerial data is also linked to the Parlgov data infrastructure on parties, elections and cabinets (Döring and Manow 2012) allowing us to derive information about parties and party systems in the countries we study.

The actual data set we use for the study presented is generated by various software scripts. With the help of these scripts we aggregate ministerial appointments into single spells in cabinets and measures of portfolio salience into importance scores for ministries. We combine all uninterrupted periods in cabinets into a single observation including reappointments and changes of ministerial

responsibility. Short breaks of less than two weeks are however ignored. For every ministerial spell we calculate the importance of all ministries controlled by an individual based on ministries weighted by duration within the spell.

Ministerial importance scores are based on portfolio measures in Druckman and Warwick. Some portfolios in our dataset did not match precisely to a portfolio in Druckman and Warwick's survey for that particular country. In this case, we used either a portfolio score which matched approximately (e.g. "Trade" was often matched to "Commerce"), or we used a default score which was set at the 25th percentile of all scores in the country (see Bright *et al.* 2012: 13). Portfolios are aggregated into ministerial positions based on the following formula.

$$\sum_{i=0}^{n-1} \frac{x_i}{2^i}$$

where n is the number of portfolios, and x is the importance score for each individual portfolio, in decreasing order of importance. This corrects, at least partly, for obvious inflation of the importance of ministers that hold multiple portfolios that results from the simple aggregation of portfolios (Bright *et al.* 2012, 14-15). Figure A1 summarizes information about the distribution of ministerial importance scores across our countries.

--- FIGURE A1 ABOUT HERE ---

Figure A1: Distribution of Ministerial Importance Scores

A3: Proportional Hazards Assumption

This section provides supporting information for the check of the proportional hazards assumption carried out on models 2 and 3. Table A2 reports the results of a Grambsch-Therneau proportional hazards test for these models. The low global test statistic for model 2 provides strong reasons to think this model is violating the assumption (conventionally anything under 0.05 is considered problematic). Three variables (effective number of parties at the last election, number of parties in government and cabinet size) have particularly low test statistics as well. These variables were stratified out of model 2 (as described in the paper) to produce model 3. The results of the Grambsch-Therneau test show a global statistic of 0.05, which is borderline but acceptable in terms of the proportional hazards assumption; whilst no other individual variables show problems with the assumption. We therefore can have confidence in the figures reported in model 3 onwards in the main paper.

--- TABLE A2 ABOUT HERE ---

A4: Cox Proportional Hazards Models Broken Down by Time Period

--- TABLE A3 ABOUT HERE ----

Tables

Table 1: Illustrating differences between measures of ministerial tenure: the early career of Brian Lenihan Snr., Ireland

	Tenure in:	
Temporal boundaries	**One position**	**Government**
Within cabinet term	*1964*-1965 1965-1966 1966-1968 1968-1969 1969-1973 Early *1973*	*1964*-1965 1965-1966 1966-1969 1969-*1973*
None (overall time)	*1964*-1968 1968-1969 1969-1973 Early *1973*	*1964-1973*

Table 2: Descriptive Statistics for individual-level variables by country

Country	**N (spell in govt.)**	**Mean survival in govt, years (sd)**	**Previous experience (% obs. in country)**	**Gender: male (% obs. in country)**	**Mean importance (sd)**	**PM (% obs. in country)***	**Mean age at start in years (sd)**
Austria	194	4.5 (3.5)	14 (7%)	155 (80%)	1.33 (0.40)	10 (5%)	49.7 (7.3)
Finland	468	1.8 (1.8)	172 (37%)	396 (85%)	1.34 (0.58)	34 (7%)	49.1 (8.5)
Germany	221	4.9 (3.4)	20 (9%)	190 (86%)	1.13 (0.42)	8 (4%)	51.4 (7.9)
Iceland	150	3.8 (3.0)	40 (27%)	130 (87%)	1.29 (0.60)	20 (13%)	50.4 (8.6)
Ireland	272	3.5 (3.0)	126 (46%)	258 (95%)	1.40 (0.56)	19 (7%)	50.0 (9.0)
Luxembourg	103	5.9 (5.0)	28 (27%)	87 (84%)	1.82 (0.49)	8 (8%)	49.8 (8.1)
Sweden	246	4.2 (4.1)	38 (15%)	170 (69%)	1.13 (0.38)	11 (4%)	49.1 (8.0)
All	1654	3.6 (3.4)	438 (27%)	1386 (84%)	1.31 (0.53)	110 (7%)	49.8 (8.3)

* At any point during a spell in office.

Table 3: Cox Proportional Hazards Models

	Model 1: Baseline Model	**Model 2: Time Varying Covariates**	**Model 3: Stratified Model**	**Model 4: Nested shared frailty model**	**Model 5a: Competing Risks – Left without Party**	**Model 5b: Competing Risks – Left with Party**
Importance	0.73(0.06)***	0.82(0.07)**	0.84(0.07)**	0.86(0.07)*	0.92(0.01)***	1.12(0.02)***
Gender (male)	1.00(0.07)	0.98(0.07)	0.95(0.08)	0.94(0.08)	0.83(0.01)***	1.31(0.02)***
Age	1.01(0.00)***	1.02(0.00)***	1.02(0.00)***	1.02(0.00)***	1.02(0.00)***	0.98(0.00)***
Previous Experience	1.56(0.06)***	1.41(0.07)***	1.32(0.06)***	1.20(0.07)**	1.05(0.01)***	0.93(0.02)***
Prime minister	0.67(0.12)***	0.88(0.14)	0.83(0.14)	0.82(0.13)	1.00(0.02)	0.94(0.03)*
Size of party (% seats)	0.99(0.00)**	0.99(0.00)***	0.99(0.00)***	0.99(0.00)*	0.99(0.00)***	1.01(0.00)***
L-R party position	1.02(0.02)	1.01(0.02)	0.99(0.02)	1.03(0.05)	1.61(0.04)***	0.89(0.02)***
Cabinet size (no. of ministerial positions)	0.97(0.01)***	0.96(0.01)***				
ENP after last election	1.62(0.04)***	1.64(0.04)***				
No. parties in govt.	0.85(0.02)***	0.84(0.02)***				
N (spells in govt.)	1654	1654	1654	1654	992	662

*** = p < 0.001** = p < 0.01* = p < 0.05

Table A1: Descriptive statistics for system- and party-level variables by country

Country	**N (Spell in govt.)**	**Effective Number of Parties (sd)**	**Cabinet size: number of portfolios (sd)**	**Parties in govern-ment. (sd)**	**Party seat share % (sd)**	**Left-Right position of party (sd)**
Austria	194	2.69(0.64)	14.69(2.25)	2.48(0.66)	41.57(10.48)	5.2(1.64)
Finland	468	5.02(0.38)	13.58(3.15)	4.59(1.01)	21.57(7.33)	5.19(1.35)
Germany	221	3.37(0.59)	18.58(2.48)	3.94(1.02)	29.08(15)	5.42(1.38)
Iceland	150	3.82(0.48)	13.13(3.11)	3.58(1.13)	26.9(9.84)	4.76(1.74)
Ireland	272	2.9(0.37)	18.86(3.3)	3.63(1.28)	40.17(15.01)	5.79(0.97)
Luxembourg	103	3.48(0.42)	22.78(7.84)	2.95(0.57)	32.8(9.38)	5.83(1.42)
Sweden	246	3.65(0.47)	19.59(5.68)	3.64(1.46)	33.01(15.64)	4.78(1.71)
All	1654	3.77(0.98)	16.67(4.96)	3.76(1.28)	30.86(14.15)	5.26(1.48)

Note: The unit of observation here is that used in model 1 of table 3, i.e. an individual spell in cabinet for a minister

Table A2: Grambsch-Therneau Proportional Hazards Test

Variable Name	**P Values Model 2**	**P Values Model 3**
Importance	0.76	0.26
Gender Male	0.03	0.25
Age	0.90	0.14
Previous Experience	0.90	0.60
Is Prime Minister	0.06	0.32
Size of Party (% of seats)	0.56	0.09
Left-Right position of party	0.09	0.27
Effective Number of Parties at last election	0.00	
Number of Parties in Government	0.00	
Cabinet Size (no. ministerial positions)	0.00	
Global	0.00	0.05

Table A3: Cox Proportional Hazards Models Broken Down by Time Period

Model 1 Table 3, broken down by time period	1945-1970	1970-1990	1990-2011
Importance	0.80 (0.10)*	0.62 (0.10)***	0.65 (0.12)***
Gender (male)	0.64 (0.20)*	0.96 (0.14)	1.04 (0.11)
Age	1.01 (0.01)*	1.01 (0.01)*	1.01 (0.01)
Previous Experience	1.69 (0.11)***	1.44 (0.10)***	1.33 (0.14)*
Prime minister	0.65 (0.18)*	0.85 (0.21)	0.54 (0.28)*
Size of Party (% of seats)	0.99 (0.00)**	1.01 (0.00)	1.00 (0.00)
Left-Right position of party	1.04 (0.03)	1.07 (0.03)*	0.95 (0.03)
Effective Number of Parties at last election	1.92 (0.08)***	1.86 (0.07)***	1.28 (0.08)**
Number of Parties in Government	0.77 (0.04)***	0.79 (0.05)***	0.91 (0.04)**
Cabinet Size (no. ministerial positions)	0.99 (0.01)	0.96 (0.01)***	0.98 (0.01)*

Model 4 Table 3, broken down by time period	1945-1970	1970-1990	1990-2011
Importance	0.79 (0.12)*	0.90 (0.11)	0.87 (0.14)
Gender (male)	0.69 (0.21)	0.97 (0.15)	1.02 (0.12)
Age	1.02 (0.01)***	1.02 (0.01)***	1.02 (0.01)**
Previous Experience	1.05 (0.12)	0.84 (0.11)	1.08 (0.15)
Prime minister	1.03 (0.21)	0.84 (0.23)	0.54 (0.34)
Size of Party (% of seats)	0.97 (0.01)***	0.99 (0.01)	0.99 (0.01)
Left-Right position of party	1.08 (0.07)	1.01 (0.08)	0.97 (0.07)